SURVEY OF ORAL EVALUATION PRACTICES

ORAL EVALUATIONS

This paper provides information regarding the different types and uses of oral evaluations in the nuclear industry. It addresses commercial nuclear industry and Department of Energy oral evaluation requirements and practices, and contains examples of how orals are used for licensing, certifying, or qualifying nuclear facility operations and maintenance personnel.

TYPES OF ORAL EVALUATIONS

Several types of oral evaluations are used in the licensing, certification, or qualification of commercial and DOE nuclear industry operations and maintenance personnel. Oral evaluations include oral questioning, oral examinations, and oral boards. Regardless of the type of oral evaluation, questions should be based on learning objectives derived from position or job descriptions, task analyses, and associated training program content.

Oral Questioning

The first and most basic type of oral evaluation is oral questioning. Oral questioning is used as a training or evaluation tool to ascertain an individual's knowledge of theoretical concepts, equipment, systems, and procedures, and can be used in all training and evaluation settings (i.e., classroom, on-the-job training, in-plant walkthroughs, simulator, etc.). Oral questioning is not normally graded as pass/fail, nor is it used as the sole criterion for determining an individual's ability to perform licensed, certification, or qualification duties.

Oral Examinations

The second type of oral evaluation is the oral examination. Oral examinations are normally conducted one-on-one (evaluator/examinee), and allow the evaluator to interact with the examinee to probe the individual's knowledge associated with particular tasks and systems to a greater depth than is generally accomplished with a written examination. Oral examinations may be conducted in conjunction with facility walkthroughs and/or performance evaluations and are formally graded as pass/fail.

Oral Boards

The third type of oral evaluation is the oral board. Oral boards typically consist of 3 to 5 people who ask an individual questions to probe and assess his/her knowledge regarding theoretical concepts, equipment and system operation and interactions, and normal and emergency operating procedures. Oral boards are formally graded as

pass/fail. Oral boards are normally conducted outside of the facility environment in conference rooms or classrooms. Some facilities supplement written and oral examinations with an oral board to determine the suitability of operators and senior operators for licensing or certification.

NUCLEAR REGULATORY COMMISSION (NRC) REQUIREMENTS/UTILITY PRACTICES

NRC Requirements

Nuclear utility operator licensing is governed by Title 10, Code of Federal Regulations, Part 55 (10 CFR 55), Operators' Licenses. 10 CFR 55 requires that an operating test be administered to applicants for reactor operator and senior reactor operator licenses. Operating tests for power reactors are required to be administered in a plant walkthrough and either a simulation facility (which could be the plant) which the Commission has approved or a simulation facility consisting solely of a plant-referenced simulator which has been certified to the Commission by the facility licensee. Operating tests evaluate an individual's skill at performing licensed tasks. Operating tests, administered by the utility, are required annually for reactor operator and senior reactor operator requalification. The NRC is required to administer an operating test once during the six year term of each reactor operator and senior reactor operator license. Oral boards are not required by 10 CFR 55.

ANSI/ANS-3.1-1981, "American National Standard for Selection, Qualification, and Training of Personnel for Nuclear Power Plants," is endorsed by the NRC as the standard which provides an acceptable approach for complying with the qualifications and training requirements of 10 CFR 55. ANS 3.1-1981 requires the owner organization to administer a pre-license, comprehensive examination of licensees to determine the individual's ability to operate the plant in a safe and competent manner. The Standard encourages the owner organization to use pre-license written and oral examinations to determine the individual's ability. In addition, ANS 3.1-1981 requires the utility to administer an annual oral examination as part of the requalification program.

NUREG-1021 (Rev. 6), "Operator Licensing Examiner Standards," requires 3 independent examinations for power reactor licensees that include 1) a 4 to 6 hour written examination, 2) 2 - 3 scenarios performed on the plant-referenced simulator, and 3) a plant walk-through. For the walkthrough examination, 10 Job Performance Measures (JPM) covering 7 systems in the Control Room and/or simulator and 3 systems in the plant must be developed. Prior to the walkthrough examination, the utility is required to forward copies of their JPMs to the NRC examiner. The NRC

examiner reviews each JPM and has the option to use these JPMs or to develop new ones. Each JPM represents one specific task and is presented to the examinee in the form of initial plant conditions and an initiating cue. The examinee performs the task, and at the completion of the JPM, the examiner asks a minimum of four questions related to the system covered by the JPM. These questions, the expected responses, pertinent references, importance factors, etc., are prepared in advance. The examiner is encouraged to ask additional questions based on what occurs during the performance of the JPM, but is required to document the exact question asked and the word-for-word response of the examinee. After completion of the examination the examiner will look up the correct answer. The position of the NRC is that this advance documentation, review, and up-front effort makes the examination more valid. This results in a more objective examination, and makes it more likely that an appeal of an examination failure will stand the scrutiny of an appeal panel and/or the civil courts should the need arise.

NUREG-1021 (Rev. 6) also provides guidance for administering the senior reactor operator and reactor operator licensing examinations for non-power reactor license candidates. Non-power reactor licensee examinations also consist of 3 independent sections that include 1) a shortened 2 to 3 hour written examination (with theory questions), 2) an operating examination consisting of an actual reactor startup and discussions covering plant system and component failures in place of a simulator examination, and 3) a plant walk-through. These examinations, especially the discussion section on plant failures, require full pre-examination preparation and documentation just as in the power reactor examinations.

The NRC is currently placing emphasis on examination validity, reproducibility and consistency, and maintaining as much objectivity as possible. It is not foreseen that the NRC will attempt to use the "oral board" examination format for the licensing of commercial facility operations personnel. Nor is it expected that the NRC will require the owner organization to conduct oral boards or that ANS 3.1 will be revised in the future to require oral boards. Performance based exams such as simulator examinations and Job Performance Measures are being used to allow a direct evaluation of the ability of an examinee to operate the facility.

Utility Practices

Nineteen commercial nuclear utilities were contacted to get a cross-section of oral evaluation practices. All of the commercial utilities contacted use "one-on-one" oral questioning in the training of their candidates for licensing. There are several ways this type of oral evaluation is used in the training process.

1. Most facilities use ordinary question-and-answer sessions, especially in the areas of plant theory of operations and use of procedures. This method is also

used during simulator exercises. During these exercises, an event occurs, or the examinee takes some action, and the instructor asks for an analysis of the event or why the examinee took the action he/she did. This type of questioning is very open-ended and is not practical to grade, but it does allow the instructor to provide immediate feedback to the responses given.

2. One of the more common forms of oral evaluation is a "panel walk-down," which is conducted either in the control room or in a plant-referenced simulator. In this evaluation, the instructor and the examinee start at a control panel and the instructor asks a question. Based on the response of the examinee the instructor can continue to ask questions specific to the control panel or expand the questioning to include any portion or all of the related system. This is valuable in exercising the examinees' ability to "think on their feet." However, this is a subjective means of evaluating an individual's knowledge level and provides little consistency from individual to individual.

3. Somewhat like a panel walk-down is a general "plant walk-down." This is a one-on-one tour of the plant with questions being asked by the instructor. Again, this is a subjective method and is difficult to document, but it does exercise the examinee's knowledge of the plant and points out areas of weakness.

Oral boards have limited use in the commercial nuclear industry. Of the nineteen utilities contacted, six use oral boards as progress checks for operations and maintenance personnel, Only two utilities use oral boards for qualification. Utility oral boards that are used for qualification of operations personnel normally consist of representatives from operations (operations supervisor or shift supervisor), training (training supervisor or instructor), and the candidate's supervisor.

DEPARTMENT OF ENERGY (DOE) REQUIREMENTS/CONTRACTOR PRACTICES

DOE Requirements

The standard for training and qualification of DOE reactor and non-reactor nuclear facility operating organization personnel is defined in DOE Order 5480.20, Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities. This Order establishes written examination, oral examination, and operational evaluation requirements for certification and qualification of operators, maintenance personnel, and the technical staff. Written examinations, oral examinations, and operational evaluations are required for initial certification and recertification of operators and supervisors. Oral examinations are not required for qualified positions. For certified Category A reactor facility personnel, the oral examination and performance evaluation must be separate. For certified Category B reactor and non-reactor nuclear facility personnel, the operational evaluation and the

oral examination may be combined. DOE 5480.20 allows the oral examination to be conducted as a one-on-one walkthrough, by an oral board, or by a committee consisting of personnel identified by contractor facility management.

Contractor Practices

At present, a majority of DOE Category A reactors (4 of 6) use oral boards for the certification of reactor operators and senior reactor operators. One of the two Category A reactors which does not use oral boards for initial certification uses oral boards for reactor operator recertification only. Most Category B reactors and non-reactor nuclear facilities do not use oral boards. However, oral boards are used at some DOE nuclear facilities to certify or qualify operators, fissionable material handlers, and maintenance personnel.

Ordinary question-and-answer sessions are used by DOE reactor and non-reactor nuclear facilities, especially in the areas of plant theory of operations and use of procedures. Many DOE nuclear facilities use the one-on-one facility or simulator walkthrough (four DOE Category A reactors have simulators).

A majority of DOE reactor and non-reactor nuclear facilities are in the process of implementing the oral examination requirements of DOE Order 5480.20. Contractors are required to establish procedures that govern examinations, including oral examinations.

For those DOE reactor and non-reactor nuclear facilities who use oral boards, the board normally consists of individuals from operations management, the training department, and a cross-crew peer evaluator, and may include a non-voting representative from the Department of Energy. Oral board makeup varies with the position for which certification is being granted.

APPENDIX A

Appendix A contains commercial nuclear utility and DOE Category A reactor oral evaluation practices and a matrix that illustrates the types of oral evaluations and how each is used at the nineteen utilities that were contacted and the six operational DOE Category A reactor facilities.

APPENDIX A

COMMERCIAL UTILITY/DOE SPECIFIC INFORMATION ON ORAL EVALUATION USAGE

Commercial Utility Oral Evaluation Usage

All listed utilities use the one-on-one question/answer sessions in the simulator and conduct practice plant walk-throughs, JPMs, and panel walk-downs. These are used specifically as part of the training process and are typically not formally graded. They do not use pre-scripted questions or have specified areas to cover during the walk-through.

The following commercial nuclear utilities were contacted either by phone or by talking to former employees now working elsewhere within the industry.

Utility A (1 unit)

This utility uses practice walk-throughs and panel walk-downs in the training process, but has no formalized oral examination or board of any kind.

Utility B (3 units)

Prior to Rev. 6 of the Examiner Standards, this utility used the old style walk-through examination (random questions asked during a tour of the plant) as a graded exercise to determine knowledge levels during the training process. Prior to the NRC license examination each license candidate had a one-on-one walk-through in the plant with a senior instructor or the training supervisor. Neither of these individuals had a specific list of questions to ask or areas to cover. The decision to allow the candidate to sit for the NRC examination was made on the basis of how well the candidate answered the questions and performed during the walk-through.

After Rev. 6 took effect, this utility modified their training programs to reflect the new NRC examination format with JPMs taking the place of walk-throughs. The pre-NRC license exam walk-throughs have tapered off and the specific unit training supervisor makes the final decision on sending a license candidate to the NRC license examination.

Utility C (1 unit)

This utility has no formalized oral examination/oral board programs in use and does not intend to implement any in the foreseeable future.

Utility D (1 unit)

This utility has no formalized oral examination/oral board programs in use and does not intend to implement any in the foreseeable future.

Utility E (1 unit)

This utility trains and evaluates their license candidates in conformance with Rev. 6 of the Examiner Standards, modifying their methods as the Standards are revised. They do not utilize oral examinations/oral boards.

Utility F (1 unit)

This utility trains and evaluates their license candidates in the NRC examination style, modifying the programs as the Examiner Standards are revised. The candidate's progress during the training program is monitored via weekly examination grades and performance in the plant-referenced simulator. Normally, no candidate would be dropped from the license training program until after the results of the Audit Examination (an examination that is identical to the NRC license examination, which is given at the 50%, 80% and 100% progress points in the program) are available. The training manager and the operations supervisor make the final decision to drop a candidate from the program.

This utility uses a formal oral board in the qualification of facility maintenance personnel. After the classroom and on-the-job portions of the training is completed satisfactorily, a 2-member oral board is convened to determine final qualification. This board consists of one instructor and the individual's supervisor. The board is conducted similar to final oral boards in the Navy. Following the board, the determination to qualify the individual is at the discretion of the two board members.

Utility G (1 unit)

This utility uses oral examinations as part of the final sign-offs for each watchstation a license candidate is qualifying for. This is similar to the Navy's "End-Of-Card" signatures and consists of a final "checkout" on each of the qualification cards by a senior plant operator who asks questions until satisfied with the individual's knowledge level. This is done as part of the training process prior to the final preparations leading

up to the license examination. Other than this, the utility uses the NRC format for examining their license candidates prior to the NRC license examination.

Utility H (1 Unit)

This utility has no formalized oral examination/oral board programs in use and does not intend to implement any in the foreseeable future.

Utility I (1 unit)

This utility has no formalized oral examination/oral board programs in use and does not intend to implement any in the foreseeable future.

Utility J (1 unit)

This utility does not use any formalized oral examination/oral board in the training program or final qualifications other than Training Review Boards. These boards are convened to evaluate marginally-performing individuals.

Utility K (1 unit)

This utility has no formalized oral examination/oral board programs in use and does not intend to implement any in the foreseeable future.

Utility L (>3 units)

This utility has a system-wide use of oral examinations and oral boards in the qualification of all operations department personnel at all units. These are final qualification boards consisting of 3 members, and the board members may use a page of suggested questions and areas to cover. 2 of the 3 board members must agree to pass the individual. If the individual passes the board and the final NRC format audit examination, they are allowed to sit for the NRC license examination. In order to provide some protection for all involved, a 2nd board will be video-taped if a candidate fails the first board. This utility's corporate training organization is currently standardizing oral board programs and is providing more guidance on oral board conduct. However, the utility does train and examine their personnel in accordance with the NRC guidelines to prepare them for that examination format.

Utility M (1 unit)

This utility currently uses oral boards in the qualification of their non-licensed operators and for progress review (determination of weak areas) of their license candidates. These boards consist of 3 members. 2 of the 3 members must agree to pass an

individual. These boards have a list of pre-scripted questions, the results of which are factored into the board's decision. In comparison to previous years, the number of oral boards is decreasing at this facility, and the overall enthusiasm level for boards at the facility has also dropped. It is expected that oral boards will be phased-out in the future.

Utility N (1 unit)

This utility uses the oral board format only for determining the status of marginal performers in the operations training program. Board members ask technical questions and questions dealing with the "philosophy" of operating the unit. All other training and examinations use the NRC format.

Utility O (1 unit)

This utility uses a form of one-on-one oral examination in the training of their senior reactor operator candidates. Prior to sending them to the NRC license examination and placing them on shift, they are required to go through a short series of discussions with senior plant operations personnel on the "philosophy of plant operations." These discussions cover pre-selected areas and topics regarding plant operations.

Utility P (>3 units)

This utility uses various formats of oral examinations and oral boards in their non-licensed operator, maintenance, chemistry, and radiation protection training. Chemistry and radiation protection examinations consist of a final qualification oral walk-through, with the content of the examination coming from a pre-established walk-through examination bank. Maintenance personnel are qualified for each specific major task (pump seal replacement, valve repacking, etc.) by a "task qualification" checkout on each task. The non-licensed operators are qualified on each of their watchstations by a planned walk-through by a training department representative and an operations department representative. For personnel qualifying to operate high voltage switchgear/disconnects, etc., non pre-scripted questions are asked prior to qualification. The license candidates are trained, qualified, and examined in accordance with the NRC methodology with no formalized oral examination program.

Utility Q (1 unit)

This utility uses oral examinations and oral boards extensively in the training of operations personnel. They feel that this format is useful as a training tool. Their boards are used at various "check" points throughout the operations training program. For example, after the candidates complete theory training they will receive an oral board consisting of 2 training department members and 1 operations department

member. This board will cover only the theory training completed to this point. They continue as the candidates complete systems training, simulator training, etc. These boards have no formal prior planning on what specific questions to ask, and the pass/fail decision is based on the opinions of the board members.

Utility R (1 unit)

This utility uses various forms of oral examinations and oral boards for the non-operator portions of their training programs. The maintenance and chemistry training programs use on-the-job training and laboratory exercises to determine final qualification of the candidate. The Reactor Engineering department utilizes a formal oral board as the final check prior to placing a shift technical advisor (STA) on shift. Non-licensed operators must successfully pass an informal one-on-one walk-through with the shift supervisor of the crew they will be assigned to prior to being placed on the watchbill. Additionally, they use a Training Review Board to check progress/attitude/problems that a prospective license candidate may be having during license training. This board has no formalized advance preparation and does not normally ask technical questions. All formalized licensed operator training and examination is done in accordance with the NRC Examiner Standards.

Utility S (1 unit)

This utility has a well established and procedurally-directed oral examination program for the training of licensed operators. The program is set up to check the candidate's progress at predetermined points in the training program leading up to the NRC license examination. These check points occur after academics training, after systems training, and after simulator training. After academics training, the candidate receives a 2-3 hour, one-on-one oral examination and a 4 hour written examination. The candidate must pass both to continue on in the program. After the systems portion, there is a 5 hour, one-on-one oral examination and a 6 hour written examination. Again, both must be passed to continue. After the simulator portion, there is a 3 hour oral examination, followed by at least a 3 hour session in the simulator with the candidate performing a reactor startup. During this session the examiner continues to ask questions.

These oral examinations have a great deal of advance preparation with each being tailored specifically to the individual being examined. The content tends to go into weak areas the candidate has shown in previous examinations and during training. This utility does not use any form of oral board to qualify personnel, but they do use the NRC Examiner Standards as the basis for training and examining license candidates. The audit examinations given to candidates prior to the NRC license examination are done by an outside group contracted by the utility and are identical to the NRC format license examination.

DOE Category A Reactor Oral Evaluation Usage

All operable DOE Category A reactors use the standard one-on-one question/answer sessions and conduct plant walk-throughs in the training, certification, and qualification processes.

DOE Category A reactor training managers were contacted by phone for the information provided below.

Reactor A

This DOE reactor facility uses various forms of oral evaluation for their certification and qualification programs. The maintenance and health physics training programs use on-the-job training to determine final qualification of the candidate. Oral questioning and oral walkthroughs are used in the certification process for shift supervisors, senior reactor operators, and reactor operators. Formal oral boards are used for final certification of shift supervisors, senior reactor operators, reactor operators, and chemistry technicians. Oral board questions are made up by the board members prior to the board and the candidate's answers are documented and evaluated.

Reactor B

Oral questioning, oral walkthroughs, and formal oral boards are used in the certification/qualification process for shift supervisors, senior reactor operators, reactor operators, maintenance personnel, health physics technicians, and chemistry technicians. Oral board questions are documented by board members as they are asked. The candidate's answer is evaluated, but not normally documented.

Reactor C

The maintenance and chemistry technician training programs use limited on-the-job training to determine final qualification of the candidate. Oral questioning, oral walkthroughs, and formal oral boards are used in the certification process for shift supervisors, senior reactor operators, and reactor operators. A formal oral board for the certification of health physics technicians has been proposed, but not yet approved. Oral board questions are made up by board members and reviewed by the board Chairman prior to the board. The candidate's answers are evaluated, but not documented.

Reactor D

This DOE reactor facility uses oral questioning and oral walkthroughs for their certification and qualification programs. Oral questioning and oral walkthroughs are used in the shift supervisor, reactor operator, maintenance personnel, health physics technician, and chemistry technician certification/qualification process. Oral questioning, oral walkthroughs, and drill scenario evaluations are used in the certification process for shift supervisors and reactor operators. During the conduct of the oral walkthrough examination, the evaluator asks questions in topical areas from a form adapted from the NRC Operator Examination Report. The questions asked during the walkthrough are documented. The candidate's answers are evaluated, but not documented. Formal oral boards are not used at this reactor facility.

Reactor E

Oral questioning and oral walkthroughs are used in the shift supervisor, reactor operator, maintenance personnel, and chemistry technician certification/qualification process. Oral boards are only used in the recertification process for reactor operators. Recertification oral board questions are documented by board members as they are asked. The candidate's answers are evaluated and documented.

Reactor F

This DOE reactor facility uses various forms of oral evaluation for their certification and qualification programs. The maintenance training program uses JPMs and oral walkthroughs to ensure competency prior to qualification. The health physics and chemistry technician training programs use oral walkthroughs to determine final qualification of the candidate. Oral questioning, oral walkthroughs, and formal oral boards are used in the certification process for shift supervisors, senior reactor operators, and reactor operators. Oral board questions are made up by the board members prior to the board and the candidate's answers are evaluated and documented.

Commercial Nuclear Utility Oral Evaluation Matrix

UTILITY	EXAMINEE			PURPOSE			ORALS USED			EXAMINERS			PRE-SCRIPTED QUES/EXAM
	OPS	MAINT	C/RP	TRNG	PROG	QUAL	ORAL QUES	ORAL EXAM	ORAL BRD	OPS	TRNG	SUPVSR	
UTILITY A	X			X			X				X		NO
UTILITY B	X			X			X				X		NO
UTILITY C	X			X			X				X		NO
UTILITY D	X			X			X				X		NO
UTILITY E	X			X			X				X		NO
UTILITY F		X				X			X		X	X	NO
UTILITY G	X				X			X		X			NO
UTILITY H	X			X			X				X		NO
UTILITY I	X			X			X				X		NO
UTILITY J	X				X				X	X	X		NO
UTILITY K	X			X			X				X		NO
UTILITY L	X				X	X		X	X	X	X	X	YES
UTILITY M	X				X				X	X	X	X	YES
UTILITY N	X				X				X	X	X	X	NO
UTILITY O	X			X				X		X			NO
UTILITY P[a]			X			X		X				X	YES
UTILITY P		X				X		X				X	NO
UTILITY P	X					X		X		X	X		NO
UTILITY Q	X			X	X			X	X		X		NO
UTILITY R[a]		X	X			X		X			X	X	NO
UTILITY R	X				X	X		X			X	X	NO
UTILITY S	X				X			X	X	X			YES

a. Where utilities are listed more than once, examiner(s) are different for the positions listed.

DOE Category A Reactor Oral Evaluation Matrix

REACTOR FACILITY	EXAMINEE			PURPOSE			ORALS USED			EXAMINERS			PRE-SCRIPTED QUES/EXAM
	OPS	MAINT	C/RP	TRNG	PROG	QUAL	ORAL QUES	ORAL EXAM	ORAL BRD	OPS	TRNG	SUPVSR	
REACTOR A [a]	X					X	X	X	X	X	X		YES
REACTOR A			X			X			X	X	X		YES
REACTOR B [a]	X					X	X	X	X	X	X	X	NO
REACTOR B			X			X	X	X	X	X	X	X	NO
REACTOR C	X					X	X	X	X	X	X	X	YES
REACTOR D [a]	X					X	X	X			X		NO
REACTOR D		X				X	X	X			X		NO
REACTOR D			X			X	X	X			X		NO
REACTOR E [a]	X					X	X	X	X	X	X	X	NO
REACTOR E		X				X	X					X	NO
REACTOR F [a]	X					X	X	X	X	X	X	X	YES
REACTOR F		X				X	X	X				X	YES
REACTOR F			X			X	X	X				X	YES

a. Where reactor facilities are listed more than once, examiner(s) are different for the positions listed.

LEGEND

Examinee

OPS -- Operations personnel
MAINT -- Maintenance personnel
C/RP -- Chemistry/Radiation Protection personnel

Purpose -- Purpose of the oral given to the examinee

TRNG -- Oral given for training the examinee
PROG -- Oral given to check the training progress of the examinee. Also used to determine continued participation in the particular training program
QUAL -- Oral given to determine the final qualification of the examinee

Orals Used -- Specific types of orals given to the examinees

ORAL QUES -- One-on-one questioning in the plant during walk-throughs or in the simulator, and is used throughout the commercial industry as part of the training process. Results of questioning not formally graded
ORAL EXAM -- Formalized questioning in the plant on walk-throughs or in the simulator. Results of the exam formally evaluated/graded
ORAL BOARD -- Formalized questioning in a closed-door, classroom setting. Results of board formally evaluated/graded

Examiners -- Personnel presenting the orals to the examinees

OPS -- Operations department - Operations Supervisor, Shift Supervisor,

TRNG -- Training department - Instructors, Training Supervisor

SUPVSR -- Individual examinee's supervisor, supervisor of examinee's department

Pre-Scripted Ques/Exam -- Established examination or question banks. Questions are also based on examinee predetermined weak areas